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Ueber Gesichtsfeld-ermüdung und deren Beziehung zur concentrischen Gesichtsfelddeinschränkung bei Erkrankungen des Centralnervensystems. WILHELM KÖNIG. pp. 152, 13 Figs. Leipzig, 1893.

On the Physical Nature of Hysterical Unilateral Amblyopia and Sensitivo-sensorial Hemianæsthesia. BERNHEIM. *Brain*, 1893, pp. 181-90, 4 Figs.

On the Visual Path and Center. S. E. HENSCHEN. *Brain*, 1893, pp. 170-80.

A discussion of the psychical side of fatigues and defects of sight, which are usually ascribed to the optical mechanism, finds a suitable preface in the briefest possible outline of the cerebral tracts and centres concerned in vision. The present short paper by Henschen would seem to be the essence of this author's work, "Beiträge zur Pathologie des Gehirns," and may furnish such an outline so far as this field is concerned. The visual path is divided into three portions respectively: the frontal, optic nerves, chiasma and tracts; the middle, the ganglia of the brain-stem with which fibres of the optic tracts connect; and the occipital, the course of visual nerves in the cerebral hemispheres. In following this tangled mesh of connections a distinction must be made between "visual" fibers and "optical" fibers. Optical fibers serve as reflex paths, but have no visual function. Of the three great central ganglia into which the optic tracts flow, in the pulvinars and the anterior corpora quadrigemina, the external geniculate bodies, the last are "the main sight ganglia in man." This is the result of the author's analysis of clinical cases. Destruction of one external geniculate body invariably causes hemianopsia. The occipital portion of the visual path is more difficult to determine. Analysis of all clinical cases bearing on the subject leads Henschen to place the visual path in the "optic radiation of Gratiolet," in a bundle of fibers less than a centimeter thick, lying at the level of the second temporal gyrus and sulcus. Lesion of parietal lobes induces disturbances of vision only if this bundle be compressed,

The visual centre Henschen would limit to the calcarine fissure, which he would like to call the "cortical retina." Other portions of the occipital lobe so often and persistently included in the optical centre, possibly have functions closely associated with vision. Word blindness would indicate this. As to the organization of the visual centre, a single case, that of Hun, is taken to prove that the upper lip of the fissure represents the upper retinal quadrant. Clinical evidence is considered to support Wilbrand's conclusion that the macula is innervated by both hemispheres. Those afflicted with hemianopsia always retain vision at the point of fixation.

Bernheim demonstrated, in 1886, that subjects of hysterical or suggested amblyopia unconsciously neutralize their correct visual images by an act of mind. "They see with the bodily, not with the mental eye." A most instructive case by way of further demonstration is the one now reported, that of a youth of nineteen, who came out of an attack of influenza nearly hemianæsthetic on the left upper half of the body. Amblyopia of the left eye with dischromatopsia were prominent features. With this eye he cannot see a finger held before the face, and white and blue are called red; yellow, blue, and red, gray. Yet, with a prism held before the right eye, he sees two images, and tested with Snellen's (Stöben's modification) apparatus, he sees all six letters and recognizes their colors. Further, when sent to an oculist, whose glasses throw him off his guard, he is able to read perfectly well with the blind left eye alone. The visual fields are contracted, the left more than the right, as is usual in hysteria. A cure is sug-

gested and both return to nearly normal. The left ear and nostril were likewise affected and it was possible to show that here, too, the difficulty was altogether psychic. With eyes closed the patient could not find his left hand with his right. Hypnotized and given the suggestion that his right hand was a magnet, the hands came fairly together. All the above symptoms and tests demonstrate that all the disturbances of sensation, special and common, were of cerebral origin; "a disease of the conscious *aesthesodic* cells," is the way the author expresses it. Three weeks' psychical treatment restores all functions.

König's paper is, for the most part, a careful, detailed statement of clinical cases. For testing the fatigability of the visual field, he used Wilbrand's simplification of Förster's method, the perimeter tests being made only in the horizontal meridian. In all, seventy-four cases were examined, in which contraction or fatigue of visual field was demonstrated. The result of chief interest at present in the present connection is the conclusion which he reaches, *viz.*, that visual fatigue is probably of retinal origin; while contraction of visual fields is to be considered, at least in a number of the cases, as depending upon functional disturbances of the cerebral cortex. This corresponds in the main with Wilbrand's results and with the findings of Pflüger and Schiele.

III.—EXPERIMENTAL.

On a Photometric Method which is Independent of Color. O. N. ROOD. American Journal of Science, XLVI. Sept. 1893, 173-176.

To determine the luminosity of a color in terms of gray or any other color by ordinary photometric methods is by no means easy, very slight differences in color making comparison more or less uncertain. The method proposed by Professor Rood has the advantage of great simplicity and does away entirely with the need of comparing the colors in the ordinary sense. It depends upon the observation that when a colored disk is combined on the color-top with an equally luminous gray disk, no flickering is to be seen, even with slow rotation, while, if a difference in luminosity of two, or even of one per cent., is present, a flicker can be detected. When the flicker is absent the colors blend in "a soft, streaky way." A test of the method, made by measuring separately six disks, (forming three complementary pairs) and calculating the brightness to be expected from combining them, and then actually making the combination, resulted as follows:

	Observed.	Calculated.	Difference.
Purple and green.	27.5	27.5	.0
Red and blue-green.	20.2	21.1	.9
Yellow and blue.	27.85	29.1	1.25

The method is equally applicable to comparing two colors or two grays. A considerable series of grays is necessary for making the original determination (the author used 100), but when a few standard disks of bright color have been accurately measured, other disks can be measured by matches built up with these standards and black and white. It is, as the author observes, "a matter of some interest in physiological optics to know that the sensation called 'flickering' is independent of wave length and connected with luminosity."

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